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Medical Officers of Schools Association.

Presidential Address

AND

DISCUSSION.

ANNUAL GENERAL MEETING, 1930.

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Notes on the value of Clinical, Dietetic and Physical Records in Public Schools.

Records of various sorts are kept by and for the Medical Officers of all Public Schools. They vary much in scope and in method. Their compilation takes up a good deal of time, which in the case of a busy man, may seem to him to be time wasted, for the majority of School Medical Officers have other no less urgent calls on their time and energies. It is important therefore that all records should be of definite value, and as I hope to show, be uniformly kept. School Medical Records fall naturally into one of three heads, Clinical, Dietetic and Physical.

It is my intention to deal with these heads to-night from one aspect, and to try and show that the statistical method in record keeping is of considerable use to the Clinical side of School medicine. The function of the School Medical Officer is as much preventive as curative, even though the number of clinical cases he deals with during a school term may run into a considerable figure. Apart from the purely clinical, the whole time Medical Officer certainly, and the part timer to a greater or less extent, is also concerned with epidemiological and topographical problems that in ordinary practice more often affect principally the Medical Officer of Health. In all these avenues of work it is my experience that the availability of properly analysed data are of considerable help and often shorten and simplify the solution of the particular problem.

A medical man, possibly a cynic and obviously a man of mature age and sound judgment nevertheless defines the statistical method as "a popular system of Research, veiled in mystery and illustrated by symbols" (1). Another doubtless equally qualified to judge calls it "a painful necessity" (2). While a leading article in *The Lancet* on Medical Statistics (3) in a short review of the progress of this branch of research during the last 30 years points out that much of the literature dealing with medical statistical problems is, and must be, written in a language which the ordinary medical reader cannot understand.

I hope, however, in these notes, that, avoiding pessimism on the one hand, and opacity on the other, I shall show that such data have a definite value even in the hands of an amateur, and are difficult neither of collection nor of manipulation.

To get the best value from such data it is to be remembered that they are interdependent, often in a way that is not always at first obvious, and occasionally is quite unexpected. Some fact as to the incidence or duration of a particular batch of cases may throw an unexpected light on a diet deficiency, or a loss of weight in bulk out of season may shew up in a group of boys, and prove traceable to an alteration in House or School routine.

Some may object that the collection and analysis of data about incidence and duration of illness, the exact proportions of a dietary or the seasonal variations in weight of an adolescent community, is a work of supererogation and that satisfactory clinical results may be obtained equally from case records, simple observation and a personal knowledge of the patient and conditions. Up to a point this is true, but it has to be admitted that impressions and conclusions founded on them are apt to mislead, and preventive medicine based on them only does not always make for accuracy or the best result. In this connection Francis Galton wrote "General impressions are never to be trusted. Unfortunately, when they are of long standing they become fixed rules of life and assume a prescriptive right not to be questioned. Consequently, those who are not accustomed to original enquiry entertain a hatred and a horror of statistics. They cannot endure the idea of submitting their sacred impressions to cold blooded analysis. But it is the triumph of scientific men to rise superior to such superstitions, to desire tests by which the value of beliefs may be ascertained, and to feel sufficiently master of themselves to discard contemptuously whatever may be found untrue."

I quote this passage in full for two reasons ; firstly, put in a slightly less astringent form it has a practical application to our work, though I hope its criticism no longer generally applies; and secondly, because it forms the opening paragraph of an instructive article by Dr. Percy Stocks—"On the Value of the Statistical Method in Practical Medicine," to which I would refer those who are actively interested should they not have seen it. (4)

The demand for Statistical Records from Public Schools has of late been increasing and is likely to increase still further. Investigation in the past

has shown that, while a great amount of time and labour has been spent and is being spent by many in making records, many of the records made are of little use for the purposes of general statistical research, or often even for comparison with records in other schools. The reason for this is that no uniform system has been evolved, and in many cases the data are either incomplete or the method of collection and recording is variable.

Clinical Records.

It is unnecessary to give a full list of the usual records needed in the working of a school medical practice, and to do so would be impertinent. Each of us has his own method which is no doubt quite as good as his neighbours. Unfortunately, our methods are not uniform in system, and therefore results taken from them are probably statistically incomparable.

I will, however, mention two forms of Clinical Record that are of direct import to the subject of this paper.

(1) A summarised list of all Cases should be made at the end of each term, giving the total number of cases in each disease, and the average duration in days. A third column giving the number and kind of complications (if any) is a useful addition. Such a list proved of great use in relation to diets, both during and since the period of rationing.

(2) A card index should be kept for all communicable diseases for each boy in the school, separate from the ordinary case paper usually begun on his admission. This card should show on the top the name and house of the boy and the date of birth and admission to the school, day, month and year being given in both cases.

This index has many practical uses, from providing an immune team to forecasting the extent of an impending epidemic. It takes only about 1 hour a term to keep it up to date, and a complete list of "immunes" or "non-immunes" for any disease can be made from it by a couple of intelligent convalescents in about 2 hours.

Another device I find most useful in dealing with infection is a spot map of the dormitories on which the school number of each boy is marked on his bed each term. It shews at a glance where infection may spread, and sometimes makes it possible to take steps to deal with this should it seem advisable. This, however, is probably only a possible method where the dormitories are uniform.

Dietetic Records.

Here we come at once on debatable ground. The system of feeding is different in so many schools, and supervision that is easy in one is probably difficult, if not impossible, in another. Also there has been so much public discussion on school diet, most of which was very ill informed and little of it of any real value, that it is difficult to see exactly how best to deal with this question in the short time available. Also very few data appear to be

available in any practical form. I believe the majority of school dietaries are very fairly adequate quantitatively, while that in most prep. schools appears to be too plentiful. Probably many are deficient qualitatively. But I confess I do not see how this can be either proved or disproved in the absence of full data which can be analysed to show the proportional make up of the food eaten. Even this should by rights be checked against the record of frequently taken weights. Many of us have been too ready to accept the existence of a varied *menu* as evidence that all was well. Now *menus* prove nothing, and are evidence of nothing, except that they may show that variety exists. They certainly give no information as to adequacy either quantitavely or qualitatively. My own experience has shown that you cannot safely rely on anything less than a regular analysis (on paper of course) of the dietary, term by term when satisfactory, but week by week if things are not right, and that this must be considered in conjunction with the weight records.

Such a record properly compiled furnishes definite information, and if the necessary precautions in extracting the weights of foodstuffs are taken, the result is as near accuracy as it is possible to get outside a laboratory investigation.

(*a*) The first thing needed is a quantitative list of all foodstuffs, in the raw, as issued to the kitchen, taken week by week. This is obtained from the steward's issue book or other record, which should always be open to inspection by the School Medical Officer.

From this is calculated from the "Value Table" the exact proportion of the constituents of the dietary in grammes for carbo-hydrates, proteins and fats, and the total calorie value of the diet. The value table is calculated for the various foodstuffs as cooked, allowance being made for loss in cooking and bone. These values should be graphed.

It is necessary to be able to make a rough estimate of the various vitamins present in the dietary and of the chief inorganic constituents. These are shown on the "Value Table."

Before making the calculations, the proportional amount of foodstuff (if any) used in the feeding of Staff, if they are fed from the same kitchen, must be deducted, and also a varying allowance for waste (waste of course is of more than one kind), and if leakage can be ruled out, the calorie value of what ordinarily comes out on the plates can usually be averaged if conditions are otherwise satisfactory.

Unless one has a personal experience of such an analysis it is impossible to realise how an apparently adequate dietary can vary, either in excess or more often in falling short in one or more essential constituent. (The chief shortage is likely to be of Vitamin C, less often now of Vitamin A. Excess is more likely in the carbo-hydrate foods). One result of our records seems to indicate that the recent increases in meat and butter and milk have caused a large fall in the amount of carbo-hydrate foods which in the forms of bread, cake and jam are the chief foods that are to any extent usable at the

discretion of the individual boy. A graph drawn up from these details shews clearly the effect of the rationed dietary on each year of age through the school. Note that this especially marked in the years of puberty from 14 to 16, but it already began at 12. The years 17 and 18 at the top contain too few boys for the average to be comparable with the former, and the years 9 to 11 both contain fewer boys, and are also complicated by the inclusion of new boys who have not been long enough under the same conditions.

A food analysis graph should also be kept up-to-date and used in conjunction with those for weight and sickness.

Physical Data.

I was led to take over the measurements for the school towards the end of 1916, by which time it was evident that the war was bound to effect adversely the feeding of a school population, and that close supervision of every likely factor was necessary. Amongst other measures in various directions we began to take weight and height at the beginning and end of each term, but before the end of the first year we found that to watch the dietary effectively a mid-term weighing was also necessary. This was begun in January, 1918, and continued.

The measurements were taken on one or two consecutive afternoons, weight and height being recorded at the beginning and end of each term, weight only at mid-term, while in December of every year the fore-arm, upper-arm, and chest in full inspiration and expiration were taken in addition. These proceedings for 800 boys take on average $4\frac{1}{2}$, 2 and 6 hours respectively, that is part of one, two or three afternoons. The boys are weighed in shirts, breeches and stockings, without shoes.

Each house of 50 boys attended in age order (thus the index cards did not need constant rearranging). They were weighed by two sergeants working simultaneously, each with an Avery yard-arm platform scale with height standard attached. The measurements were called out and written down by the M.O. direct on the card. He also had time to enter the age and date and also run an eye over the boys on the scale. In addition to name and house, the actual day, month and year of birth should be written on the top of the card, and the day, month and year also stamped on at each weighing.

Each house must be weighed at the same time of day in relation to meals and games, and in the same clothes.

Before each weighing, the scales and height standard require regulation.

The weights should be taken to the nearest $\frac{1}{4}$ lb. and the heights to $\frac{1}{8}$ inch. Also it is important that the recorders and weighers should always be the same persons.

If these requirements are carried out, the results will furnish material that can be used for anthropo-logical purposes in addition to the more limited purpose now under consideration.

Next was shewn the graph of the averages found by Mr. Caesar Hawkins about 1890 to 1900 for 40,000 public School boys. They shew the average for Weight, Height and W/H from 10 to 19 years. These weight averages are higher than those of the Anthropo-metrical Survey published in 1883, but not so high as our present average.

The results on the card index are now available for many purposes. For comparison with dietetic and sickness records it is necessary to extract weights only in two separate ways.

(1) The amounts lost or gained or stationary for each year of age, and for each house are copied out on separate sheets, averaged and the % gain and loss calculated.

(2) The actual weight for each boy is copied out in age groups for each house and averaged. The averages for the whole school are then taken and graphed.

The first gives a comprehensive check on each boy and each house. The second shews the progress of the school by age groups in relation to diet and sickness.

This comprises all the necessary work to get the graphs already shewn. The working out of the figures for 800 boys takes on average from 4 to 6 hours three times a term. Personally I have found the results so useful that I have gone on with the routine, though the urgent necessity perhaps no longer exists. No one will mind giving up the short time necessary, and the boys take an active interest in the results with, I believe, considerable benefit to their condition. The mere fact of seeing each boy partially stripped every six weeks is very helpful. Many boys may go through their school life without coming to the M.O. as patients. If such a boy makes an unusual appearance as a patient it is of great value to have this extra knowledge of him in one's mind. This six-weekly weighing has actually lead me to spot cases of early T.B. and Diabetes, when without it, time, possibly weeks, must have been lost or the condition possibly left unknown for discovery in the holidays.

The more experience I have of weighing as a routine, the more am I convinced that it is one of the more important clinical aids the School M.O. has at his disposal.

Time does not allow of the consideration of the various sources of error that may creep in ; they are many. Neither can I indicate many of the other uses the records can be made to serve.

I should also like to show graphs dealing with two further points, and first those graphs shewing the actual records of the six-weekly weighings from 1916 to 1927 with the Sickness Curve given at the top. Next the graph which is I think an important one, shewing the % number of boys under the average on entry to the school. Observe how this rose in 1927 when national shortage commenced. It starts from the pre-shortage figure of

about 20 % to one between 50 and 60 % then keeping up until its peak of 75 % is reached in 1921, then gradually falling with improved national conditions until the end of 1928. Since which we appear to have recovered the 1914-15 figure. These under-average boys were assessed on the W/H figure in conjunction with the personal factor. An attempt has also been made to find a 3 dimensional formula for average size. In school work Vital Capacity or Buoyancy Tests are too exhaustive a method for constant use and the C2 of mean chest girth, *i.e.*, $\frac{W}{H \times C^2}$ is too lengthy for the amateur.

Further graphs were shewn, giving the annual progress in growth of the 16-17 group of boys for each year from 1917 to 1925, and shewing how the effect of a short dietary retarded the rate of growth, and the date of recovery under improving conditions.

Had time permitted, I should like to have shewn other interesting facts that these graphs, especially the diet graphs, show, but to do so would have required a further paper. It is impossible even to allude to them.

It may possibly be objected that such work is unnecessary, that it is impossible for anyone who is not a whole-time Medical Officer, or that its introduction would cause irritation in various directions. There is not time to produce proofs to the contrary, but I am sure practice would show that none of these objections are valid, or at the worst the third might prove purely temporary and disappear, as has been my own experience, as soon as its interest and its clinical and economic value have become apparent.

To prove adequately that such methods are not too arduous and to indicate the many directions in which they are of use would require at least three further papers, but I hope that the few results here shown may be sufficient to prove that even in the hands of an amateur the use of elementary statistical methods has a real value in relation to the practical side of Public School medicine.

REFERENCES.

1. C. A. Gill. Genesis of Epidemics, p. 23.
2. W. P. LeFeuvre. Journal of the Medical Assn. of S.A. (B.M.A.), Dec. 28th, 1929, p. 697.
3. Lancet, June 16th, 1928, p. 1233.
4. Lancet, June 16th, 1928, p. 1242.

DISCUSSION.

THE CHAIRMAN said it was his duty, from the chair, to thank Dr. Friend very warmly for his most interesting paper. The high ideal which the new President had laid down would be very difficult for others to follow. Dr. Friend was a dictator at Christ's Hospital, as had been said by another, certainly he had more liberty there than some medical officers of schools had got.

DR. A. A. MUMFORD said he would like to express his very deep appreciation and gratitude for this remarkable work which Dr. Friend had brought before the Association. To the speaker it was interesting because it gave every side of the picture. In the residential school the medical officer had in his hands the supervision of all the dietary; but the speaker had no such supervision. At Manchester Grammar School one had very little grip in regard to the food, but they had to see what were the results of the different changes which were the effects of the War; which of the boys could bear strain such as was met with in school life, and which were the boys who succeeded more than others; also which boys did better, and which made a success of life after leaving school. Also, what were the physical measurements and other factors in boys who, if they went to a University, successfully studied medicine, art, engineering, or other technical subjects?

As he was listening to the address he reflected how easy Dr. Friend had made these matters, and how much he had shortened the time required to carry out the tabulation of the essential details. In the buoyancy test and the respiratory test the question arose as to how much help could be expected from the mathematical folk at the school. In taking out the buoyancy index at his school the first group of figures was worked out for him by Sir Joseph Burns, of the Prudential Life Assurance Company, and he said it took 200 hours of his staff's time to arrive at the figure. He, Dr. Mumford, asked a member of the mathematic staff of the school to evolve a ready-reckoner. It was done now in less than a minute per boy. As soon as such vital figures were brought

before the right authority, it was astonishing how one could get at people who were deeply interested in the matter.

A remark was made by Dr. Lempriere to the effect that Dr. Friend was an autocrat at his school. The speaker considered that he deserved to be an autocrat, because of the hard work he must have put in to be able to convince the authorities of the great value it was to have men who would go to so much trouble in the matter.

As to the practical applications in these respects, it was now nearly 60 years since, as a boy of 8, he first went to Christ's Hospital. Though it was now a long time since the days of Coleridge and Charles Lamb, there were many traditions at the time the speaker went. At the time he was referring to, at Hertford, the ration was a small mug of very watery milk and some bread. The saying was still the talk of the school: "Anyway, this is better than the beer they used to have." So in the '60s the dietary must have been weak beer and bread, with a little scraping of butter. Because of that low dietary there was a good deal of ringworm in the school. He, the speaker, was away from school in the sick room for nearly a year, as those in medical charge could not cure his ringworm. Ultimately, when he came to London, under Dr. Aldersmith, they were applying glacial acetic acid to the ringworm areas, and those present would realise the effect of that on an anæmic, under-fed schoolboy. But the buildings were good, there was warmth, and the boys were kindly treated.

Once a fortnight he used to have a very bad headache, and had to go to bed, and he and other boys who were ill had a rest-cure in the sick ward. Gradually conditions improved, and the boys concerned turned up regularly for their medicine, and were given a glass of portwine. At the age of 11, the speaker was transferred to London. There the milk given was of very poor quality, and one could see the chalk mark at the bottom of the containing vessel.

Members could now see, from what the new President said and had shown on the graphs, what was the result of having a "dictator." When, 18 months ago, the speaker visited Christ's Hospital he could not help a feeling of profound gratitude that the old order of things had passed away.

Another thing he would mention, and which might be of interest to school medical officers, was that he was a skinny, undersized boy, and the sickness he had interfered with his school work. When, at 16 years of age, the speaker had left Christ's Hospital and gone to Manchester, his father said he, Dr. Mumford had been away from home so much that he could now have a little home life, and would he like to go to school at Manchester? He went to Manchester Grammar School, and he still had his reports from that school. The declaration was that he was two years behind, and ought not to be so backward as he was. Dr. Friend had shown how one could build up the physique. Some of the boys at the speaker's school helped him, and each boy saw his own card and knew how he was getting on, and if he was a scientific or a mathematical boy he took considerable interest in the figures and in how he was progressing.

What was the effect on boys of what had been gone through during and since the War? The records at Manchester were all taken by the same man, or the man who taught him; only those two people had taken them since 1880; they were taken by the same method and in the same room, and the same weighing machine—frequently overhauled—was used. He, the speaker, was able to take 7,000 measurements and compare them with various years.

Since the War the following curious thing had happened, and he had no answer for it. At the ages of 11, 13, 15, 17, the height for 1927, 1928 and 1929 had risen an average of 1 inch; the weight also was rising, to the extent of 1lb. The chest girth, however, was not altering. On the other hand, the vital capacity was decreasing. The boys at those ages were heavier and bigger than formerly, with

the same chest girth, but the range of breathing, as tested by the spirometer, was diminishing. The spirometer had been sent to the instrument-maker for overhaul and re-testing. The reduction was mainly in boys born about the year 1916; they suffered most severely when young from the war depression. He was sure the children as a whole were better fed at home now than formerly. When the speaker went into the masters' common room he asked them why the boys were not breathing as well, but no explanation was forthcoming in reply. But the masters thought the boys now showed a less intensity in tackling and carrying through what they undertook. Every Whitsuntide a "treck" was carried out, and 450 boys volunteered to go on treck into Spain, North Africa, or the Black Forest. Also, a large group went to Norway, and 18 months ago some of them went to Newfoundland. The difference was as follows. Previous to the War, when a boy put his name down to go on a certain treck, it was certain that he would "stick' it. Now, however, the masters were constantly complaining that although there were plenty of promises when trecks were arrange for, there was a tendency for boys to drop out, though they seemed to be equal to former boys in mental attainments. It probably meant that the most virile fathers were away or got killed in the War, and there was a change in personnel, which would probably right itself again in a few years. He hoped it would be so.

He fully appreciated what Dr. Friend had put before the meeting. It was very important for an influential Society like this to see not only that these standards were more universally taken, but also that they were more strongly impressed upon the public.

Professor Mottram said he was very pleased to know that this kind of work was being done. When the results had been properly digested and applied he thought they would prove to be amazing. He had been particularly interested in the deficit in weight in the case of the boys entering Christ's Hospital; he had imagined that two years ago there was a return to the original

base-line in that respect, because no longer were boys entering school who were born while rationing was operative.

He intended to go to Christ's Hospital to see the methods carried out, as he regarded them as wonderful. Dr. Friend had shown that a remarkably short wastage took place in the school. It was less than 1%, which was within the ordinary margin of error, in experiment and analysis.

He also had the impression that the chief lack in school dietary was that of vitamin C, but it was easy to remedy such a defect; there were things containing it which boys ate readily.

In another of the graphs shown one saw the effect of an intake of milk. He was glad to think that Dr. Curry Mann's work was having its effect on school diets.

A point he wished to ask about was that of the dropping of "tuck shop"; what was the attitude of the school medical officer towards the tuck shop? In one school he had visited one of the Houses, the dietary was vegetarian in character, and they used a number of things: cocoanut ice, chocolate biscuits, etc. Those boys did not seem to visit the tuck shop; and the speaker wondered whether, if the boys were supplied with plenty of jam cakes, etc., they would find the school tuck shop a necessity, particularly if plenty of fruit was consumed.

He wished to thank Dr. Friend for having invited him to be present, as it had been for him a most interesting time, and he hoped the work would be published soon, as it would be most valuable not only in regard to feeding school children, but to the poor dietitian who was trying to incorporate a little science into the subject.

Dr. May said he had been very interested in this matter of the pre-war weights of boys as compared with those of present entrants to schools. The boys the speaker had to deal with at his school were, largely, sons of petty officers in the Marine and the Royal Navy, therefore he did not know whether he could compare

them with the entrants at Christ's Hospital. Most of his boys had had the ordinary food at home. Hardly any of his boys reached the standard weight when they first came to the school; and this he attributed to the effect of the war on their parents.

There was a tuck shop in relation to his school, but the school did not suffer much from it. But what they had suffered from a good deal was the sending of parcels by the parents and friends. Some contained such food as fish sandwiches, pork sandwiches, etc., which in some cases had been posted three days previous to receipt, so their condition could be imagined. Some boys had sent to them what were called "Nelson squares," and after them the boy required the usual dose of castor oil. He had fought against this large parcel-sending for years, but without success until fortune favoured him in that one week no less than 629 parcels came, overwhelming the postmen. There resulted a representation to the authorities: and now the regulation was that parcels must be received only on birthday anniversaries. Since then the castor oil consumption had gone down 75 %.

No statistics of the kind Dr. Friend showed had been kept at the speaker's school, either physical or dietary; it was a pity, as he would have been able, in the presence of such figures, to find out how war conditions had affected the boys.

Dr. Lempriere said he would not like Dr. Mumford, or anybody else, to feel that weights and measurements of the boys at school were not taken by other medical officers also. The majority of such officers took similar records, and they were extremely valuable. What was wanted, if that was possible, was uniformity of record; then much could be done in drawing conclusions from the figures. At present each school had its own method.

He had himself gone in for measuring and weighing for a considerable number of years, adopting the Baldwin Wood scale. In comparison with that scale, he found that during the war and in early post-war years the measurements and weights of the boys

were badly behind; in the 18-year boys it was 9 lbs. below, in the 13-year, 5 lbs. below. That deficit had been gradually wiped off, so that now the figure was slightly higher than before the war.

He agreed with Dr. Mumford that though the height and weight of the boys now was slightly above pre-war standard, they seemed to have less vitality, tenacity and grit, perhaps due to a number of enervating conditions, such as luxury.

He did not think the tuck shop would ever go out of school life; and it had a financial value. But it needed to be properly managed.

In school dietaries he thought the most marked reason for comment was the absence of fruit. He had failed to have a larger proportion incorporated into the school dietary, but every boy who went to the sick house or sanatorium got fruit during the whole time he was there. And in the school generally he had managed to get it included twice a week. In early post-war days, fat deficiency was very marked, and when full butter rations were restored, the boys' weights went up.

He repeated that if uniformity of record could be secured at schools it would be admirable. He was personally prepared to scrap his system, even at this comparatively late period of his life, if schools generally were willing to adopt a better one.

THE PRESIDENT, in replying on the discussion, said it had been his intention to express his gratitude to the members of the Staff of Christ's Hospital and to the boys who had given him voluntary help to find a way out on different points. If one had a good senior boy who was convalescing in the infirmary, it was a useful thing to induce him to take an interest in this statistical work, and it created an atmosphere of interest in the school. And as long as papers were not interfered with, boys had the run of his laboratory to see what was being done. Continuous help could not be expected from masters.

He agreed with those who thought the boy had not yet got back to his pre-war energy.

The tuck shop question was a very debatable one. The tuck shop had its value, but no school tuck shop should exist unless it was under the direct supervision and control of the medical officer. Sometimes the speaker had to descend with violence to prevent the selling of things to merely satisfy boys' cravings, and selling them just in order to swell the dividends.

In reply to Surgeon-Captain May's remarks, he would have thought that the boys at Dr. May's school had parents financially better off than had 60% of the boys at Christ's Hospital. Those who came in because they had won scholarships at elementary schools were physically the pick of his school, and they were considerably in advance of those who came in on presentation.

He fully agreed with Dr. May's remarks about food parcels being sent to boys. At Christ's Hospital it was considered to be too great an interference with the liberty of the subject to stop them altogether; but it was limited in the preparatory school to birthdays, except for the matter of fruit. He had long been trying to educate parents to send boys fruit instead of "tuck," and an infirmary notice ran "You may send him fruit, but no tuck." Some parcels arrived without proper packing, and all mushed up, and of some the contents were in a state of decomposition.

He agreed with those who said the vital capacity of the present boy was less than formerly; and at present that was out of medical control, and he did not know what was the explanation for this comparative lack of "vim." If more fresh fruit could be got into the school dietary it might have an economising effect on other articles of diet. A certain amount of money was allowed to be spent on the dietary, and he consulted with the lady superintendent who spent it to the best advantage. For instance, if boils, etc., were found to be on the up-grade, diet was arranged accordingly, one inclusion being vegetarian C. vitamin.

Geo. Creasey & Sons, 10, Bull Plain, Hertford.